

REMARKS/ARGUMENTS

Claims 1-14 are pending in the application, with claims 3, 6-9 and 12-14 having been withdrawn. By this amendment, claims 1, 4 and 10 are being amended, and new claims 15 and 16 are being added, to advance the prosecution of the application. No new matter is involved.

On page 2 of the Office Action, the drawings are objected to because the sectional views are not properly cross-hatched. A proposed drawing correction or corrected drawings are said to be required in view reply to the Office Action to avoid abandonment of the application. However, a review of the drawings shows that all of the figures are perspective, top or side views, and there are no sectional views. Therefore, no drawing amendment should be needed in this regard. This was confirmed in a telephone conversation with Examiner Norris on May 16, 2003.

At the bottom of page 2 of the Office Action, claims 1, 2, 10 and 11 are rejected under 35 U.S.C. § 102(e) as being anticipated by US 6,204,448 of Garland. Garland is said to disclose, in Fig. 3A thereof, a housing 303 having an opening, a member 302 with a surface at the opening and a feedthrough 306 brazed to the housing, the member having an opening adjacent to the feedthrough to minimize surface area contact. This rejection is respectfully traversed, particularly in view of the claims as amended herein.

On page 3 of the Office Action, claims 4 and 5 are objected to but are indicated as being allowable if rewritten in independent form.

Briefly stated, the present invention provides feedthrough apparatus which has a metal housing with an opening therein and a base having a surface at the opening. A ceramic feedthrough extends through the opening in the housing and forms an interface therewith, and is brazed to the housing at the interface. The surface of the base extends at least to the feedthrough and has a cut-out area or

opening therein adjacent to the feedthrough in order to minimize the surface area of contact at the interface between the ceramic feedthrough and the metal housing.

The opening in the base may have edges which extend from side walls of the feedthrough under the feedthrough by small distances, in order to form a small ledge beneath the outer periphery of the feedthrough. Alternatively, the opening in the base may be approximately equal in size to the feedthrough so as to have edges which engage side walls of the feedthrough. The design of the feedthrough apparatus with its minimum of surface interface between the ceramic feedthrough and the metal housing provides for relaxed tolerances therebetween and permits brazing of the feedthrough at the opening within the housing using a high temperature brazing compound.

This is highly advantageous in view of the fact that the ceramic feedthrough has a given coefficient of thermal expansion and the metal housing has a coefficient of thermal expansion which is substantially different from the given coefficient of thermal expansion of the ceramic.

In contrast, the Garland'448 patent does not show or describe feedthrough apparatus in which a ceramic feedthrough extends through an opening in a metal housing, in the manner of the present invention. Rather, the reference describes a packaging structure in which a lead 306 extends therein. Lines 55 and 56 of col. 3 identify the element 306 as a metal lead. Lines 27 and 28 of col. 3 identify element 303 as a conductive seal ring wall which forms a part of the packaging. Thus, the lead 306 does not form a feedthrough in the manner of the present invention. Such feedthroughs are electrical or optical in nature and are typically made of ceramic. The housing, on the other hand, is typically made of metal which has a coefficient of thermal expansion substantially different from the coefficient of thermal expansion of the ceramic feedthrough. However, such substantial difference is accommodated by the design of the feedthrough apparatus in accordance with the invention which minimizes surface area contact at the interface therebetween. In Garland, the strip

like metal lead 306 and the housing are made of like or similar material, so that the same problem does not exist. It is therefore understandable that the reference does not show or suggest feedthrough apparatus which minimizes the surface area contact at the interface between the feedthrough and the housing in the manner of the present invention.

As amended, claim 1 defines feedthrough apparatus in accordance with the invention in which a feedthrough is brazed to a housing at the interface therebetween and the surface of the housing extends at least to the feedthrough and a member of the housing has an opening therein adjacent the feedthrough to minimize surface area contact at the interface between the feedthrough and the housing. As amended, claim 1 further recites "wherein the feedthrough is made of a first material having a given coefficient of thermal expansion and the housing is made of a second material having a coefficient of thermal expansion which is substantially different from the given coefficient of thermal expansion of the first material". This characterizes the ceramic-metal interface of structures in accordance with the invention as distinguished from structures like those described in Garland where the lead and the housing are made of like materials and the design does not minimize surface area contact at the interface of the feedthrough and the housing in the manner of the present invention. Therefore, claim 1 is submitted to clearly distinguish patentably over such reference.

Claim 2 depends from and contains all of the limitations of claim 1 so as to also distinguish patentably over the art.

Claim 4 is being rewritten in independent form so as to contain all of the limitations of claim 1 from which it previously depended, so that claim 4, and 5 which depends therefrom, should now be allowable as indicated on page 3 of the Office Action.

Claim 10 as amended contains limitations similar to those of claim 1 and is also submitted to clearly distinguish patentably over the art. As amended, claim 10 also recites "wherein the feedthrough is made of a first material having a given coefficient of thermal expansion and the housing is made of a second material having a coefficient of thermal expansion which is substantially different from the given coefficient of thermal expansion of the first material".

Claim 11 depends from and contains all of the limitations of claim 10 so as to also distinguish patentably over the art.

New claim 15 further defines the feedthrough apparatus of claim 1 in terms of the feedthrough being made of ceramic, and new claim 16 further defines the feedthrough apparatus of claim 10 in terms of the feedthrough being made of ceramic and the housing being made of metal, thereby clearly distinguishing patentably over the art.

In conclusion, claims 1, 2, 4, 5, 10, 11, 15 and 16 should be allowable for the reasons discussed above. Therefore, reconsideration and allowance are respectfully requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6846 to discuss the steps necessary for placing the application in condition for allowance.

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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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